

Abstract Submitted
for the MAR13 Meeting of
The American Physical Society

Single-Photon-Sensitive Superconducting TES Sensors for EUV Photons in Superfluid Helium FAUSTIN CARTER, SCOTT HERTEL, DANIEL PROBER, DANIEL MCKINSEY, Yale University — Incident radiation can excite superfluid helium into a diatomic He_2^* excimer, which decays through the emission of a 15 eV photon. Such excimers have been used as tracers to measure the superfluid's quantum turbulence, thanks partly to the long half-life of the He_2^* triplet state (~ 13 seconds). However, the efficient detection of these excimers remains a challenge. This work presents two different detector designs capable of in-situ detection of the He_2^* excimers either directly, or by collecting the 15 eV emission upon decay. Both detectors are based on the superconducting transition edge sensor. One is designed to operate near 2 K, while the other is designed for ~ 100 mK operation in a dilution refrigerator. We will discuss operating characteristics of both, and present preliminary data from the 2 K detector.

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Date submitted: 19 Nov 2012

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